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Strengthening local economy – an example of higher education institutions’ engagement in “co-creation for sustainability”

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Abstract. Major societal challenges like energy efficiency, climate change and resource scarcity trigger and influence continuous change processes worldwide, nationwide, but also on all regional levels. They force regions to think about (a more) sustainable development. As the transformation processes necessary for sustainable development are complex there is a need for actors willing to engage and support sustainability transitions. Higher education institutions (HEIs) are often expected to be one of these supporters on the regional level. The central aim of this paper is to show by the use of an example, that HEIs are able to provide impulses for sustainable transformation. Following [Pflitsch, Radinger-Peer \(2018\)](#) HEIs can play different roles in regional sustainable transition; the authors use two dimensions to distinguish these roles – depth and autonomy:

- As to depth HEIs’ roles can be “comprehensive, involving diverse actors and approaching sustainability with a holistic perspective” or “more fragmented and passive, but also more focused on specific topics”.
- As to autonomy the roles can be “autonomous, the university defining its own focus and priorities through interacting with a broad range of regional actors” or “more directed, the university working on topics that are relevant from the perspective of the regional or federal-state government”.

Using this rough classification the HEI in our example focuses on a “specific topic” and it is interacting with other regional respectively local actors on a topic that is not only relevant from the perspective of most German cities and their citizens but also from the national and federal government’s perspective. The paper starts with a short systemisation of transfer channels and missions of HEIs. It starts with a description of transfer channels used by the two traditional missions of HEIs – education and research. Afterwards the concept of “third mission” is introduced and distinguished from a possible fourth mission of HEIs – the concept of “co-creation for sustainability”. Afterwards it deals with important concepts and approaches which are characteristic elements of “co-creation for sustainability” – transformative research, participatory action research (PAR), urban living labs and student service learning. The “specific topic” that serves as an example is introduced after that: it is about the problem of local economy in urban neighbourhoods. Local economy will be defined, its problems resulting from the functional change of urban neighbourhoods are sketched and the arising necessity of strengthening local economies will be discussed. We show the methodological concept that is used to develop strategies and specific measures for strengthening local economy. The paper

shows that the elements of this concept are typical approaches of transformative sciences. Afterwards concrete examples stemming from an urban neighbourhood which is part of the city of Viersen (Northrhine-Westphalia, Germany) is used to show, how the approach works in practise. The paper ends trying to explain, why projects like this give an example of HEIs' impulses for sustainable development in their regional surrounding. Furthermore, the usefulness, but also the shortcomings and further research necessities of the approach will be discussed.

1 Introduction

Major sustainability topics like energy systems, climate change, pollution, resource scarcity and economic inequality trigger and influence continuous change processes worldwide, nationwide, and at the regional level. They force regional decision makers to think about (a more) sustainable development. As the transformation processes necessary for sustainable development are complex, there is a need for actors willing to engage in and support sustainability transitions.¹ Higher education institutions (HEIs) are often expected to be one of these supporters on the regional level. The central aims of the following paper are to show by use of a case-study that HEIs are able to provide impulses for sustainable transition as well as to describe the research approach and methods used to generate these impulses, comparing the experiences of the case-study on hand with findings from other case studies.

The next section (Section 2) gives a short historical outline of the research interests regional sciences had and still have in the context of regional effects of HEIs. It starts with a description of transfer channels used by the two traditional missions of HEIs – education and research. Moreover, the concept of “third mission” is introduced and distinguished from a possible fourth mission of HEIs – the “co-creation for sustainability”. Section 3 deals with important methodological concepts and approaches which are characteristic elements of “co-creation for sustainability” – transformative research, participatory action research (PAR), urban living labs and student service learning. A specific example about the problem of “local economy” in urban neighbourhoods is introduced in Section 4. Local economy is defined; its problems resulting from the functional change of urban neighbourhoods are sketched, and the arising necessity of strengthening local economies is discussed. Section 5 starts with a description of a methodological concept used to develop strategies and specific measures for strengthening local economies. The paper shows that the elements of this concept are typical approaches of transformative sciences. Afterwards concrete examples stemming from an urban neighbourhood in the city of Viersen (North-Rhine Westphalia, Germany) are used to show how the approach works in practice. The paper ends with a concluding summary (Section 6) explaining why projects like this illustrate an example of HEIs' impulses for sustainable development at the regional level. Furthermore, the usefulness, but also the shortcomings of and further research necessities for the approach are discussed.

2 Regional Effects of HEIs – From Demand-Side Effects to Co-Creation for Sustainability²

For about fifty years regional sciences have been dealing with research on regional (economic) effects of HEIs. HEIs' missions and the channels through which they can provide impulses to their respective regions have been focal points of this research. Three research directions were pursued consecutively. The first line focused on effects HEIs

¹As in the literature, the terms “transition” and “transformation” are used as synonyms in this paper “to express the ambition to shift from analysing and understanding problems towards identifying pathways and solutions for desirable environmental and societal change.” (Hölscher et al. 2018, 1). The authors further argue (Hölscher et al. 2018, 1-3) that “transition” is used by the sustainability research community when talking about fundamental social, technological, institutional and economic change, but the term is mainly employed to analyse changes in societal sub-subsystems (e.g. energy, mobility, cities). Researchers concerned with global environmental change normally use transformation to refer to large-scale changes in whole societies, which can be global, national or local.

²The following considerations are partly based on Hamm, Koschatzki (2020)

achieve through their own economic activities; research concentrated almost exclusively on impulses a university gives to its regional environment solely through its existence (overviews can be found in [Voß 2004](#), [Stoetzer, Krähmer 2007](#)). These studies showed that universities have a considerable impact on regional employment and income. Meanwhile, the scientific interest in this pure estimation of so-called demand-side effects generated by HEIs' employees, students, expenses and investments has declined considerably, as the methods and limits of such analyses are widely known.

The second line of research led to a broadening of the perspective. The demand-oriented approach was extended to include the effects of HEIs via supply-side connections. This shift was caused by the increasing diversity of universities' tasks, the orientation towards the "Entrepreneurial University" transfer model (outlined by [Clark 1998](#), [Gibbs 2001](#)) and the development of the Triple-Helix model ([Abramson et al. 1997](#), [Etzkowitz, Leydesdorff 1995](#)). In this context, academic spin-offs ([Koschatzky, Hemer 2009](#), [Stahlecker 2006](#)) and scientific analyses of the research and innovation system played an important role. In the meantime, a multitude of analyses, dealing with supply-side effects of HEIs theoretically and empirically, have considerably improved the state of knowledge on their regional economic effects.

The third line of research represents a further broadening of the perspective. So far, the focus has been exclusively on the regional economic effects of HEIs. In accordance with the model of the "engaged university", all kinds of impulses stemming from HEIs and having an impact on society at the regional level are considered. The term "transfer" has therefore been extended to include not only the economically relevant transfers, but any kind of regional transfer from HEIs into society. This can be seen in analyses of regional innovation systems (e.g. [Asheim, Gertler 2005](#), [Cooke 1992, 2002](#)), which particularly address the role of the research sector. The societal dimension of regional transfer activities reflects actions that are geared to a broad regional commitment of universities and their members (employees and students). Such activities are often carried out without particular cooperation partners, but aim at specific target groups or general contributions to social life in a region (see [Koschatzky et al. 2013](#)); examples include students' consultancy projects, universities for children, pupils and senior citizens, as well as open knowledge transfer events. Thus, regional social commitment becomes another significant transfer channel for universities. It complements transfer activities of the "entrepreneurial university" focused on education, research and economic transfer with facets that go beyond the previous university commitment and are reflected in the "engaged university" (see [Breznitz, Feldman 2012](#)), meaning the global civic engagement of higher education institutions and their efforts to use intellectual resources to tackle societal issues.

Three main questions arise as a result of an extension related to this third line of research. The first research question is concerned with which socially relevant effects universities might have on their regional surrounding as by-products of fulfilling their traditional core tasks – research and education. In fact, in addition to economic effects, HEIs can trigger a multitude of socially relevant effects on their regional environment (see [Henke et al. 2016](#)). The second questions deals with whether HEIs have a third core task in addition to education and research. Meanwhile HEIs' "third mission" is generally accepted in literature. It deals with reciprocal interactions between the university and the particular region where it is located ([Roessler et al. 2015](#)). Furthermore, [Henke et al. \(2016\)](#) stress co-operation with non-academic partners aiming at societal interests as other necessary elements of the "third mission". The "third mission" bundles all kind of services that lead to a beneficial integration of the higher education institution into its extramural environment through mutual interactions.

The identification of social and economic impulses running from HEIs to their regional environments and considerations for optimising these impulses by the "engaged university type" finally led to the third follow-up research question: Are universities also able to provide impulses for sustainable transformation processes in their regional environments? There is little doubt that HEIs can increase the flexibility of regions to adapt to structural economic change and thus provide an impetus for economic transformation ([Pinheiro et al. 2015](#), [Zomer, Benneworth 2011](#), [Zawdie 2010](#)). This question is new, however, due to its

regard of transformation as change towards ecological, economic and social sustainability.

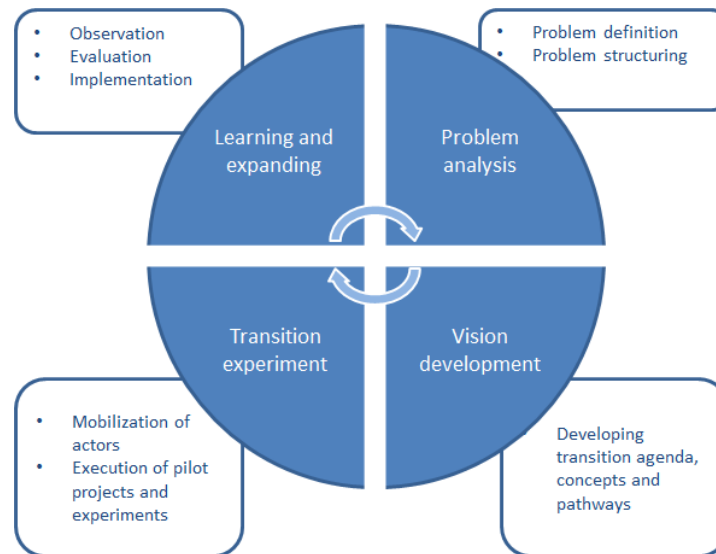
The said question specifically examines whether universities can provide important impulses to support sustainable transformation via their three missions (education, research and the so called “third mission”) or whether they can act as a change agent for regional sustainable development in the first place. According to [Stephens et al. \(2008\)](#), all challenges related to sustainable transformation can be assigned to ecological, social and technological change. To meet the sustainability challenges, [Stephens et al. \(2008\)](#) call for a transition to more sustainable practices and lifestyles. In this process HEIs must be viewed from two sides: on one hand, they are themselves objects of transformation, but on the other hand, they can also take over the function of a driving force or even a change agent. In the latter case, HEIs are expected to have a considerable solution potential at the strategic, tactical and operational levels. At the strategic level, they can participate in the development of long-term social visions. At the tactical level, they can initiate and strengthen cooperation among the regional stakeholders. Moreover, they can advance the desired transition at the operational level by changing the orientation of education, research and transfer and by internal sustainability efforts of their own. [Stephens et al. \(2008\)](#) distinguish four concrete operational categories in which universities can support a transformation towards sustainability:

1. HEIs can help to ensure that they themselves are perceived as integrated, transdisciplinary agents.
2. HEIs can carry out problem-driven research projects to overcome urgent sustainability challenges.
3. HEIs can develop sustainable solution-oriented practices for society and promote their implementation.
4. HEIs can provide participants with skills for holistic thinking and for coping with sustainability challenges in their study programs.

[Trencher et al. \(2014\)](#) also investigate the increasing involvement of HEIs in promoting the process of sustainable transformation in their regional environments in cooperation with governments and civil society actors. They call this commitment “co-creation for sustainability” and define it “as a role where the university collaborates with diverse social actors to create societal transformations with the goal of materialising sustainable development in a specific location, region or societal sub-sector” ([Trencher et al. 2014](#), 152). It must be stressed that “co-creation for sustainability” clearly differs from the “third mission”. While the latter contributes to economic and social development through transfer, “co-creation for sustainability” supports society in its quest for sustainable development ([Trencher et al. 2014](#)). [Trencher et al. \(2014\)](#) therefore suggest viewing “co-creation for sustainability” as an evolving new mission of HEIs. However, “co-creation for sustainability” should not become the sole focus of HEIs. As the three missions (education, research and transfer) already exist side by side in an “entrepreneurial university”, reinforcing each other, they could coexist with a fourth one, namely the “co-creation for sustainability”, in a “Transformative University” ([Trencher et al. 2014](#)).

Partly based on [Goldstein et al. \(1995\)](#) and [Uyarra \(2010\)](#), the explanations given so far can be summarised into four groups of regional impacts also connected with the missions of HEIs:

1. Regional demand effects (resulting from HEIs’ roles as economic actors)
2. Regional human capital effects and regional knowledge effects (resulting from HEIs’ education and research activities).
3. Regional social and political effects (resulting from HEIs’ “Third Mission”)
4. Regional co-creation for sustainability effects (resulting from a possible “Fourth Mission”).



Source: Own diagram following [Loorbach \(2010\)](#), [Schneidewind, Scheck \(2012\)](#), [Schäfer, Scheele \(2014\)](#).

Figure 1: The Transition-Cycle Model

3 Methods of co-creation for sustainability

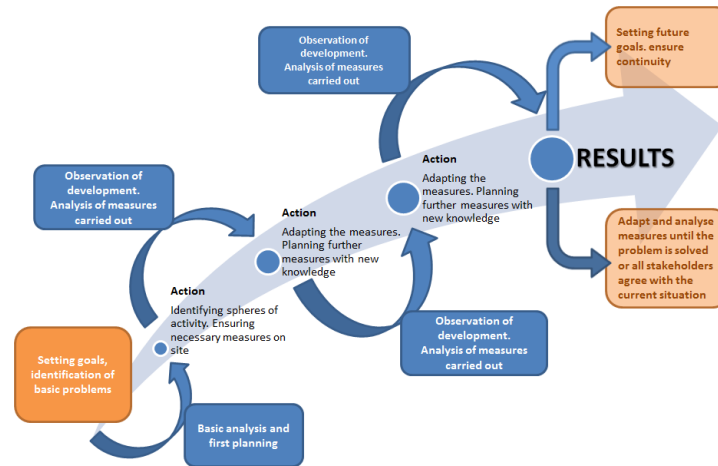
To implement co-creation for sustainability, new forms of science and knowledge production become necessary ([Trencher et al. 2014](#)); research agendas should have a greater societal relevance ([Gibbons 1999](#)), and scientific knowledge should be increasingly produced and applied in cooperation with extramural stakeholders. This explains why the methods necessary in transformation sciences and for the sustainable transformation process via co-creation for sustainability differ from those used in “traditional sciences”. Following [Trencher et al. \(2014\)](#), this is illustrated by the move from ‘mode 1’ – knowledge production that is characterized by theory building and testing within one discipline – towards ‘mode 2’, where knowledge is produced for application. These new forms of knowledge production require inter- and transdisciplinarity, a high level of participation, a mutual interaction of scientific analysis and work on site, as well as a continuous reflection of the chosen measures followed by necessary improvements. These requirements can be fulfilled by methodological approaches such as transformative research, participatory action research, real-world laboratories and student service learning. These methodological approaches are presented in some more detail below.

3.1 Transformative Research

The German Advisory Council on Global Change defines transformative research as follows: “Transformative research supports transformation processes in practical terms through the development of solutions and technical as well as social innovations, including economic and social diffusion processes and the possibility of their acceleration, and demands, at least in part, a systemic perspective and inter- and cross-disciplinary methods, including stakeholder participation” ([WBGU 2011](#), 322).

Transformative research is mostly based on the transition-cycle-model (Figure 1), which is characterized by four different phases ([Loorbach 2010](#), [Singer-Brodowski, Schneidewind 2014](#), [Schneidewind, Scheck 2012](#), [Schäfer, Scheele 2014](#)):

- **Problem analysis:** The cycle starts with analysing the question: What is the current situation? Existing knowledge from different disciplines helps to form a “snapshot” of the socio-cultural, economic, institutional and ecological situations. System knowledge is necessary in this first phase.
- **Development of transition agenda, visions and pathways:** As there is a need to



Source: Own diagram following [Walter \(2009\)](#).

Figure 2: The PAR-Cycle

develop targets and future visions, the results of the first phase are used to answer the question: “What should the situation look like in the future?”. To come up with adequate visions, all relevant stakeholders must be integrated. Future visions are generated depending on the requirements. With the help of transformative science, the chance for long lasting changes increases.

- Initiation and execution of transition experiments: Based on these visions, a third phase of experiments must follow. The central question is: Which measures should be taken to reach the desired outcome in the future? Arrangements are implemented and projects are carried out.
- Evaluation, learning and expanding: Finally, in the fourth phase of the cycle, learning effects should arise because the entire outlined process is continuously reflected on by supporters, critically evaluated and, if necessary, readjusted.

Transformative research uses research approaches focusing on collaborative and experimental learning by scientists and laypersons. One of these approaches is Participatory Action Research (PAR), which is described in the following section.

3.2 Participatory Action Research

The origins of Participatory Action Research can be traced to the work of the Prussian psychologist Kurt Lewin (1944), who is considered the founder of action research. [Attwood \(1997, cited from MacDonald 2012\)](#) explains that PAR’s philosophy embodies “the concept that people have a right to determine their own development and recognises the need for local people to participate meaningfully in the process of analysing their own solutions, over which they have (or share, as some would argue) power and control, in order to lead to sustainable development”.

PAR means that activities should take the interests of people concerned into account. The activation of the citizens via e.g. activating surveys, initiation of networks and empowerment are essential elements of its operating principles. PAR is a qualitative research methodology that fosters collaboration among participants and researchers ([MacDonald 2012](#)). It is a concept that tries to find problem solutions through the interaction of participation and action. Those affected by the research results participate in the research. Research questions do not come from “outside” but are articulated by the affected people who also participate in the search for problem solutions. The aim is to bring about positive changes and to achieve the research objective by a bottom-up approach.

Figure 2 demonstrates that PAR (Greenwood, Levin 2007, Walter 2009) uses a multi-level, cyclical approach; it encompasses a “cyclical process of fact finding, action, reflection, leading to further inquiry and action for change” (MacDonald 2012, 37). The detailed steps of the cyclical approach are as follows:

- A problem is identified by the persons involved.
- The involved community cooperates with researchers. Involved supporters and researchers act jointly, developing ideas to solve the identified problem and creating a plan.
- The plan is implemented.
- The results of the implementation are monitored by the researchers and the community.
- The final stage of the first cycle is the reflection on the results. If the actors involved are satisfied with these results, the described process of planning, action, observation and reflection will continue, building on the successful outcome. If the first action is deemed ineffective, the evaluation will influence the actions planned for the next cycle.
- This process is repeated or continued as often as necessary until the problem at hand is solved or the desired aims are achieved.

3.3 Urban Living Labs as an example of Real-World Labs

Real-world labs are another methodological element of co-creation for sustainability. A real-world lab refers to a social context in which researchers carry out “real experiments” in order to learn more about social dynamics and processes (Schneidewind 2014). Real-world labs are places of learning with different types of impact (Schneidewind et al. 2016):

- they create solutions for actual problems,
- they serve as a testing ground for the created solutions and
- they can facilitate transferability of solutions to other contexts.

If HEIs are engaged in real-world labs, they should develop place-based problem solutions and help test them in a real world environment, cooperating with society instead of working in the scientific ivory tower.

In the context of this paper, urban living labs (ULLs) are a relevant example of these real-world labs. Cities are of particular interest as places for real-world labs for at least three reasons (Schneidewind 2014). First, social experiments have a long tradition in urban science. Secondly, cities are interesting objects of reference and experiments as the entire socio-technical structure of a modern society can be found there. However, cities are less complex and therefore easier to analyse than countries. And lastly, cities are often the starting points for all kind of changes. This probably explains why real-world lab research approaches (urban living labs) are increasingly used in urban research. Three levels of urban real-world laboratories can be distinguished (Schneidewind 2014): the household level (households or blocks of flats), the neighbourhood level (urban neighbourhoods) and the city level (entire city). In the special case described in this paper, ULLs work on the level of neighbourhoods; this means the examination room remains manageable for the research process.

ULLs are seen as a new form of intervention responding to the social, economic and environmental challenges in the urban context, thus contributing to the achievement of their sustainability goals. They are defined as panels “for innovation, applied to the development of new products, systems, services and processes, employing working methods to integrate people into the entire development process as users and co-creators, to explore, examine, experiment, test and evaluate new ideas, scenarios, processes, systems, concepts and creative solutions in complex and real contexts” (Bulkeley et al. 2017, 13).

Universities and researchers using ULLs are often initiators of sustainable development in disadvantaged neighbourhoods. This means that researchers carry out experiments in order to learn about social dynamics and processes. Research institutes collaborate with politicians, the private sector, and civil society groups in this approach. ULL approaches are always “place-based”, and they aim at strengthening relevant stakeholders through actions and activities.

3.4 Student Service Learning

Student service learning is the last methodological element of co-creation for sustainability to be introduced here. It engages students in active, relevant and collaborative learning (Bringle, Hatcher 2000). Bringle, Hatcher (1995, 112) “consider service-learning to be a course-based, credit-bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.” Service learning focuses on the service being provided and the learning that is occurring. Accordingly, service learning is designed in such a way that both service aspects enhance learning, while learning processes enhance service in an integrated way. On the one hand, service learning enables students to gain new knowledge and competencies as active service providers, and on the other, the outcomes of the service activity facilitate changes towards sustainability (Adomßent et al. 2014). If the topic of student service learning is connected to sustainability in the context of a municipality or neighbourhood, it can also be seen as an example of HEIs’ increasing engagement in community outreach and aspects of societal transformation.

4 Functional Change of Urban Neighbourhoods and Consequences for Local Economy

After the introduction of relevant transformative science methods, the following considerations help describe the example of the paper on hand. Migration, demographical changes, changes in mobility behaviour and digitalization are important global trends causing and influencing adaption processes on all regional levels. This also applies to cities, urban districts and urban neighbourhoods. During these processes urban neighbourhoods often lose their previous functions in city structures. Finding new functions is often problematic and can become a long-lasting process. Economic and social problems are often a consequence for the residents and the local economy in those neighbourhoods.

The local economy in this context means all economic activities related to the development of a certain urban neighbourhood (Birkhölzer 2000). The firms behind the local economy are primarily small enterprises, and they consist of retailers, bars and restaurants, handicrafts, as well as social and household-oriented services. They are placed in and highly connected to the local neighbourhood. They fulfil different functions for their neighbourhood: they supply people living in the urban neighbourhood with everyday commodities; they offer opportunities for work; they are a place of communication and integration; and they upgrade the neighbourhood’s living conditions (Jakubowski, Koch 2009, Henn 2013). As the local economy does not only have a pure economic function for the neighbourhood and the people who live there, but also fulfils social functions for the residents, securing the provision of basic services, it should be preserved even in times of increasing digitalization and online trade – perhaps in a modified form. A process of social and economic transformation becomes necessary.

Many German cities and their urban neighbourhoods face this problem. The German government has recognised this and initiated programmes to support urban neighbourhoods suffering from problems like this. BIWAQ (stands for “Education, Economy and Work in Neighbourhoods”) is one of these programmes. It is funded by the European Social Fund (ESF) and the German Ministry of the Interior. The aims of BIWAQ are twofold – to improve job perspectives of long-term unemployed persons and to strengthen the local economy (see BMUB 2016). In case of BIWAQ-funded projects, municipalities must apply for the funding. In case of a successful application, municipalities usually

cooperate with different partners and institutions (e.g. non-profit organizations and sometimes HEIs) and define subprojects with concrete objectives and measures. The institutions involved in the implementation of BIWAQ-funded projects face the challenge of developing a strategy and appropriate measures as well as actions to strengthen the local economy. Thus, they support a process of social and economic transformation or the preservation and strengthening of existing structures.

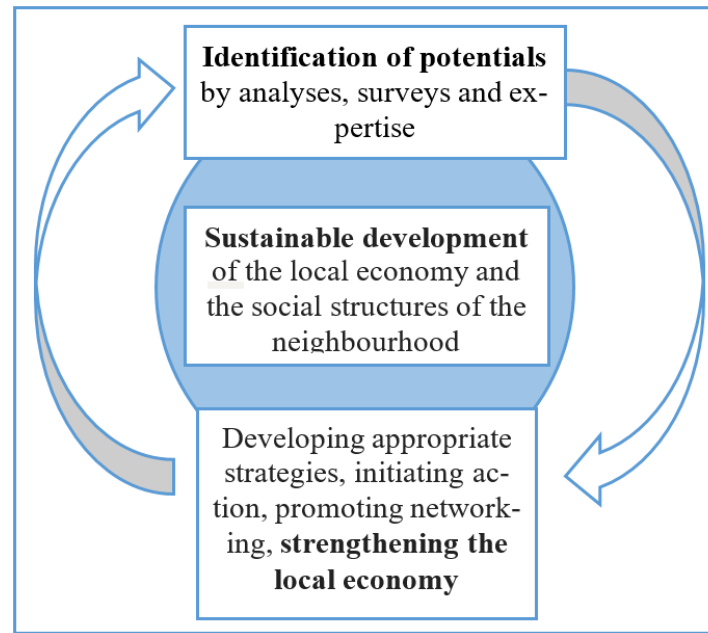
5 Case Study: Strengthening Local Economy in the “Viersener Südstadt”

5.1 *The Scientific Approach in Use*

Between 2011 and 2018, NIER and SoCon – two research institutes of Niederrhein University of Applied Sciences (NUAS) – have been engaged in three BIWAQ-funded projects. These projects aimed at strengthening the local economy in disadvantaged urban neighbourhoods of North-Rhine Westphalian cities (Viersen, Solingen and Leverkusen). In addition to the heads of projects (a political scientist and an economist), two research assistants (economic geographers, social scientists and economists) were working on each of these BIWAQ-funded projects. One of these two researchers was mainly responsible for carrying out analytical tasks necessary for developing strategies and place-based measures (e.g. stocktaking by socio-economic indicators, surveys, guideline interviews, mapping). The other researcher mainly worked as a “business manager” in the neighbourhood; he visited and advised companies. Both researchers worked closely together, being in constant contact with the project management; each researcher was always able to take over the tasks of the other. If more than one project was being worked on at the same time, the researchers were also in constant exchange with one another. The authors of this paper had been engaged in these projects as research assistant and head of project, respectively.

When the first project started, the NUAS-researchers realized that supporting economic and social transformation processes of urban neighbourhoods by strengthening local economies suggests the use of a new and different scientific approach called “transformative science”. [Schneidewind et al. \(2016\)](#) define transformative science as “a specific type of science that does not only observe and describe societal transformation processes, but rather initiates and catalyzes them. Transformative science aims to improve our understanding of transformation processes and to simultaneously increase societal capacity to reflect on them”. Starting from this definition, a general scientific approach was developed, fulfilling some requirements:

- Neighbourhoods with a need to strengthen local economy often are “multiple burdened” – economic and social problems overlap and occur simultaneously; there are also health and ecological problems in many cases. Therefore, an interdisciplinary approach had to be chosen.
- Every neighbourhood is different. The specific problems of each district require innovative ideas that must be appropriate to the special situation of the quarter on hand. But in many cases the existing knowledge and information about the urban districts’ situation is not sufficient to develop place-based perspectives, visions and measures for strengthening the local economy. A necessary condition for initiating concrete measures in the neighbourhoods is therefore learning more about the local economy’s structure, about its strengths and weaknesses, as well as about the everyday problems of the respective neighbourhood. This requires analyses before action; scientific support ensures innovative measures adequate to the causes of existing problems.
- As suggested by the PAR-approach, the necessary research and measures to be implemented should not be determined by scientists from the outside; instead a practice-oriented approach is necessary. Research should get its questions from local actors (residents and firms). On-site cooperation with local actors should help scientists identify additional research questions and further needs for information to be analysed. Results should provide impulses to the districts and its actors by



Source: Own illustration.

Figure 3: The project approach

stimulating, discussing, possibly modifying, and finally initiating and implementing projects as well as concrete measures.

- Measures should be developed in participatory processes that take local needs into account and are supported by local actors, residents and entrepreneurs. Effects of measures should be communicated to and discussed with local actors who should be regarded as experts on “their” neighbourhood. This participation-oriented approach increases the likelihood of achieving long-term effects.

Based on these requirements and the theoretical pillars introduced in Section 3, an approach (Figure 3) similar to the transition cycle model in transformative research (see Figure 1 above) was used.

- In the first step, a baseline study of the urban district on hand was elaborated. The aim of the said study was to get more information on the local economic structures, on the residents’ socio-economic situations as well as on the neighbourhood’s image and conditions. This study was mainly based on secondary statistical data and document analyses. Activating firm and passers-by surveys as well as questionnaires for local stakeholders and external experts were used to provide further information. This information was used to identify strengths and weaknesses which are the basis for developing ideas, strategies and measures for strengthening the local economy. It was important to involve the local actors and their networks in this process. On one hand, they acted as experts of their neighbourhood, and on the other, they guaranteed that measures were in line with the wishes of local residents and entrepreneurs.
- The second step encompassed the development, coordination and implementation of concrete measures and projects for the local economy in the neighbourhood. A “commercial neighbourhood manager” was working on-site in order to initiate the developed projects and measures. The “commercial neighbourhood manager” specifically addressed the local actors and supported their networking activities. Other stakeholders (local authorities, chamber of commerce and industry, regional development agencies etc.) were integrated where necessary. Furthermore, the “commercial neighbourhood manager” formed the “link” between the different local

actors and the researchers responsible for the scientific analysis, thus promoting the mutual interaction of analysis and on-site work in the neighbourhood.

The description shows that PAR is a basis of this scientific approach. The connection of the approach to the concept of urban living labs becomes clear when looking at some of the requirements mentioned by [Schneidewind \(2014\)](#):

Interdisciplinarity : in the case on hand research institutes from social sciences and regional economics are cooperating to strengthen local economy. The project team consisted of social scientists, business economists, regional economists, economic geographers, regional planners and political scientists.

Transdisciplinarity is guaranteed by continuous cooperation of the research team and local actors during the whole process of research and development.

Co-creation and co-production between the research team and the civil society is guaranteed in the research process via the participatory and activating elements.

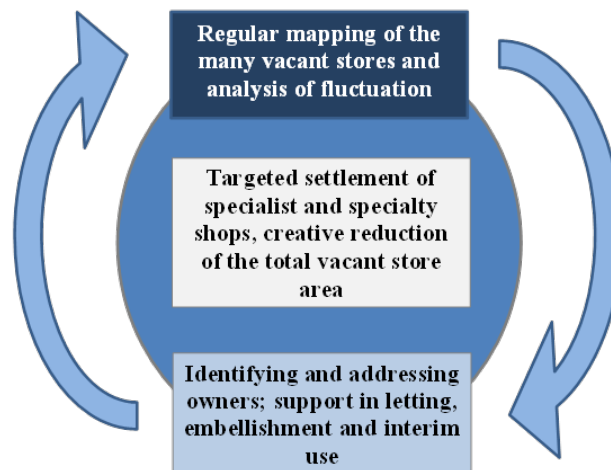
Continuous reflection of scientific methods and selected measures is ensured by discussions between the research team and local actors but also by discussions with external experts coming from different disciplines.

5.2 Examples of Concrete Action

The city of Viersen is located in the Central Lower Rhine Area (CLRA) in the west of the river Rhine, close to the Dutch-German border. With around 76,000 inhabitants (cf. City of Viersen 2016), Viersen is the capital of the Viersen district. The southern part of the inner city forms a neighbourhood with numerous stationary retailers having their shops on the ground floors; this neighbourhood is called “Viersener Südstadt”. As a former part of the inner-city centre, “Viersener Südstadt” lost its importance for retail after the pedestrian zone development in the northern part of the inner city. Since then, the area has become a peripheral inner-city location that no longer belongs to the central supply area ([Hagemann et al. 2011](#)). In 2013, a total of 112 shops were located in the streets of this neighbourhood. Cityscape and population structure clearly show traces of the changing social conditions in the neighbourhood. As in many other German cities, the functional change becomes evident, e.g. due to the relocation of retail and services, increasing vacancies and investment backlogs as well as the refurbishment of buildings. ([MWEBWV NRW 2014](#)). The vacancy rate on the main shopping streets of “Viersener Südstadt” varied between 20 and 25% during the project period. The shops in the Südstadt often do not have barrier-free access and almost exclusively have less than 100 sqm of commercial space ([Busch 2013](#)).

In the course of the project, the service providers and retail stores in “Viersen Süd” were identified as the core target group. The vast majority of these shops were owner-managed and were specialised in particular, often somewhat unusual products. During the first step, information on the economic situation of the firms was ascertained with the help of an activating firm survey (problem analysis). The firms’ opinions on the location quality factors in the neighbourhood, as well as on their future prospects, concrete needs for support and expectations connected with the BIWAQ-project were surveyed. A SWOT analysis (showing strengths, weaknesses, opportunities, and threats) and reflections of the survey results with experts from scientific and on-site practice formed the basis for developing measures to stabilise stationary retailing. Furthermore, measures were taken to raise the profile of the “Viersener Südstadt” as a location for specialized retail stores (vision development). All this was supported by another focal point of the project work: the implementation of a business-oriented on-site neighbourhood management, crosslinking (traditional) scientists using a new research-approach and practitioners from the neighbourhood.

The owners of the specialized retail stores as well as other (locally relevant) actors from existing networks of professional district developers from the urban environment – e.g. social planning, urban development, district management, city management – were



Source: Own illustration.

Figure 4: Examples of transformative methods in the project “Strengthening Local Economy in the Viersener Südstadt”

sensitized to the problems and visions of the local economy and mobilized to jointly advertise for the southern part of Viersen in a location community of specialty shops (experiments). Joint advertising measures were intensified and supported by targeted public relations work on the advantages of the location at the levels of the city administration, associations and the regional press. The left side of Fig. 4 illustrates the described interaction of analysis and work on-site in the concrete example.

The accompanying vacancy management (see right side of Figure 4) also followed this transformative research approach. Regular theme-based mapping (see Figure 5) revealed the need for action as well as documented fluctuations and categorised them into long-term and short-term vacancies (problem analysis). Having the local vision for retail trade described above in mind, an assessment of the development perspectives of the vacant retail store was made (vision development). In concrete terms, vacancy owners were contacted by the business-oriented on-site neighbourhood management in order to provide better information on the vacant stores to (specialist) shop-owners interested in settling there. Moreover, the possibilities to rededicate stores to housing were discussed with the city administration (experiment). Changes such as the settlement of further shops, the improvement of existing vacancies and the conversion of apartments were again observed, evaluated and controlled (learning and expansion).

Finally, student service learning became an integrated element of the project approach as well. Students from master courses at NUAS supported the team of researchers by conducting different types of surveys. These surveys, oriented towards specific problems of Viersener Südstadt and the existing lack of information at the local level, examined the image of the neighbourhood and – later on in the project – whether the neighbourhood had succeeded in positioning as a location for special shops (learning and expansion). On one hand, the master’s students had to provide a relevant service job for the city of Viersen, facilitating changes towards sustainability. On the other hand, the students gained new knowledge and competencies – about empirical methods, surveys and the interpretation of their results regarding the economic and social situation of the Viersener Südstadt as well as the general social and economic consequences of functional change of inner urban areas.

6 Discussions and Conclusions

The concluding section has two objectives. First, it aims to discuss the project as a possible contribution of a university to sustainable regional development of its regional environment. Secondly, the substantive results of the project is summarised and evaluated.



Source: Own illustration following (Busch 2013, 14)

Figure 5: Size, structure and barrier-free accessibility of shops in Südstadt

In this context, the following aspects are discussed in more detail:

1. Does the project presented in the paper focus on sustainability (focus)?
2. Is the project an example of co-creation for sustainability (co-creation)?
3. How can the HEIs' "sustainability impulse" be classified (classification)?
4. Which factors enabled the implementation of the project and was the project complicated by obstacles often typical in a sustainability transition process (enablers and obstacles)?
5. How can the substantive results be assessed (results)?

Focus

General trends – e.g. migration, demographical changes, changing mobility behaviour and digitalization – force structural adaption processes not only at the national level, but also at the level of regions, cities and urban districts. Neighbourhoods lose their previous functions in city structures, and the process of finding new functions is usually long-lasting and difficult. In many urban districts this process is accompanied by economic and social problems; ecological and health problems also come up often. Urban neighbourhoods in many German cities face similar problems; they are “multi-burdened” urban districts, for economic, social and ecological burdens often occur simultaneously. Efforts to support social and economic (sustainable) transformation become necessary. Strengthening the local economy is an important part of these efforts. By pursuing this objective, the projects aim to simultaneously achieve social stabilization in the neighbourhood. In the case study presented here, a university of applied sciences helps strengthen local economy and stabilize the social situation in urban districts, thus supporting transformation processes for a more sustainable development at the local level. With regard to ecology, “neutrality” has been implicitly assumed in the project. This is certainly a weakness of the project as the assumption was neither questioned nor analysed. Two dimensions of sustainability, however, have been explicitly mentioned.

Co-creation

In the presented case study, the university collaborates with social actors of urban districts to create transformation processes for sustainable development at the local level. Knowledge is produced for direct application by the use of research approaches and forms of knowledge production highly related to sustainable transition processes:

- transformative research
- participatory action research
- the idea of urban living labs and
- the concept of student service learning.

With these practises the project fulfils the necessities of co-creation explained above.

Classification

According [Pflitsch, Radinger-Peer \(2018\)](#), HEIs can play different roles in regional sustainable transition; they use two dimensions to distinguish these roles – depth and autonomy:

- When it comes to depth, HEIs’ roles can be “comprehensive, involving diverse actors and approaching sustainability with a holistic perspective” or “more fragmented and passive, but also more focused on specific topics”.
- As for autonomy, the roles can be “autonomous, the university defining its own focus and priorities through interacting with a broad range of regional actors” or “more directed, the university working on topics that are relevant from the perspective of the regional or federal-state government”.

Using this rough classification, the HEI in our example apparently does not approach sustainability with a holistic strategy. Instead of that two research institutes of this university of applied sciences interact with local actors and work on a “specific topic” that is not only relevant from the perspective of most German cities and their citizens but also from the national and federal governments’ perspectives.

Thus, the case study presented here clearly differs from those presented and discussed in detail by [Radinger-Peer et al. \(2020\)](#). Their examples (Augsburg, Freiburg, Linz and Darmstadt) can all be classified as “comprehensive, involving diverse actors and approaching sustainability with a holistic perspective”. In these four cities, an awareness of sustainability was already politically and civically anchored when the HEIs became active ([Radinger-Peer et al. 2020](#)). Moreover, the HEIs also have implemented the necessary institutional and organisational changes ([Radinger-Peer et al. 2020](#)). Both hardly hold true for the NUAS and its regional environment.

Enablers and obstacles

In the case study on hand, two aspects were important for the realization of the projects:

- Application oriented scientists – which are typical for German universities of applied sciences – with a personal research interest in the special problem of local economies in disadvantaged urban neighbourhoods and sustainable development initiated the project.
- These researchers succeeded in raising funds for their topic in close collaboration with local actors from the cities concerned. This aspect was decisive for the realisation of the project as German universities of applied sciences have almost no research budget of their own.

Thus, the combination of scientific curiosity of the participating scientists, their willingness of to change the situation in co-operation with local actors, the openness to new approaches on part of the local actors and the possibility to raise public funding has paved the way for the project implementation. On the one side, this supports the opinion of [Radinger-Peer et al. \(2020\)](#) that special features of the higher education system (e.g. freedom of research and teaching, loose coupling of units and flat hierarchies) allow for a high level of bottom-up and niche activities. But on the other side, one must confess that the paper deals with a small number of projects due to the individual commitment of staff members, i.e. only about a “pin-brick” compared to the potentials universities have in supporting sustainable development in their regional environments. Although [Radinger-Peer et al. \(2020\)](#) emphasise that individual actors – like those in the example presented here – sometimes have provided an impetus for the universities’ developments towards sustainability, they also mention ([Radinger-Peer et al. 2020](#)) that projects like this are often unconnected, lacking far-reaching visibility, and that, as a consequence of this, some of them might disappear without durable effects. In their view ([Radinger-Peer et al. 2020](#)) efforts to achieve a regional sustainability transition can only be attained through the support of the university management and the establishment of interdisciplinary institutes. This, however, requires institutional and organisational changes within the university.

The already discussed distinction between a university-wide strategic orientation towards a regional sustainability transition and individual projects aiming at regional sustainability helps explain why challenges and obstacles that often arise in connection with the new role of universities ([Aleixo et al. 2018](#), [Radinger-Peer et al. 2020](#), [Verhulst, Lambrechts 2015](#)) are rather irrelevant in the described example:

- Conflicts between and discussions about the relevance of different missions of universities did not occur, because the acting researchers had the freedom to decide and put the research focus on sustainability issues.
- The same reasoning explains why a modest willingness for change or a lack of acceptance of the concept of sustainability on the side of the university stakeholders have not been relevant.
- The concept of sustainability is often seen as an abstract and complex topic. This might lead to a different understanding of sustainability between scientists in the university and practitioners in the region. Different definitions of sustainability from actors with different disciplinary backgrounds sometimes make project work even more difficult. In addition, sustainability transitions are sometimes highly conflictual processes accompanied by long-lasting negotiations. The projects in the example did not pose these difficulties, as they did not aim at a general transition, but worked on a sustainability topic in a limited niche. In the example on hand university stakeholders and regional practitioners had a common interest. They jointly applied for funding and declared their willingness to cooperate. Accordingly, the project did not begin with theoretical discussions about definitions of sustainability, but with pragmatic work in the neighbourhood.
- Finally, there was no lack of financial resources as the researchers successfully applied for the necessary governmental and European funds. This gave them financial freedom.

Results

The last point of these concluding remarks deals with an evaluation of concrete project results achieved for the urban district on hand. This evaluation is not a scientifically based analysis, and its authors were personally involved in the projects. Nevertheless, the following aspects should be mentioned:

- The continuous interaction of local participants with an inter-disciplinary research team has proven to be a promising concept. The concept encouraged participation

from local actors. They could be motivated to engage and participate in activities for the sustainable local development. The elaboration of measures was a result of co-design and co-production of researchers and local actors in the research process. The taken measures were not set by a “top-down” arrangement but were rather elaborated and initiated by a research team and local actors through a participatory “bottom-up procedure”.

- Information and knowledge about the neighbourhood could be improved by the continuous combination of analysis and activity. These improvements allowed for the development of evidence-based measures appropriate for dealing with the causes of problems at hand.
- Neighbourhoods differ from each other and so do their problems. This means there is a need for place-based solutions fitting to the specific problems of the neighbourhood. The concept led to place-based measure recommendations.
- Continuous reflection on the scientific methods and selected measures was ensured by discussions between the research team and local actors but also by discussions with external experts coming from different disciplines.
- Finally, according to the opinion of the authors partly supported by own evaluations, the neighbourhood project was able
 - to improve the initial situation (e.g. by implementing a community of entrepreneurs, locating specialist shops and making the cityscape more attractive by reducing vacancies),
 - to counteract the negative image of the neighbourhood,
 - to strengthen the neighbourhood’s economic potential,
 - to create to create a more optimistic mood in the neighbourhood
 - to identify realistic functions and objectives for the future of the neighbourhood.
- As a consequence, all this contributed to improving the social situation in the neighbourhood, giving people new perspectives.

The example clearly shows that universities can give impulses for sustainable development in their regional environments not only by a consequent university-wide orientation towards sustainability, but also by being perceived as a “sustainable”. They can also give these impulses through their involvement and engagement in single research projects with regional partners. Universities’ contribution to sustainable regional transition often can be seen as a side product of research. In this case, universities do not play the role of a change agent for sustainable regional development but rather give pinpricks of change, and the higher the number or intensity of these pinpricks – the higher the effects for regional sustainability.

Despite this positive conclusion, there are some questions to be dealt with in future research:

- First of all, long-term external evaluation would be necessary to properly assess the success achieved by the projects.
- Secondly, the concrete, decisive factors for the success of the described case study remains unknown. The methodological approach used here seems to be a key success factor. Nevertheless, further research is necessary for a better understanding of the determinants for success or failure; governance and local socio-economic structures as well as the types of involved actors could all be important factors determining the outcome.
- Another very policy-relevant research question is concerned with whether the improvements for the neighbourhoods will be durable even after the funding ends and with how it will be possible to perpetuate the cooperation of local actors as well as their participation and engagement.

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